

CLAIMS

1. An electronic device including a shielding conductor to be united with a chip part, characterized in that

an upper surface of the chip part is coated with the shielding conductor, the shielding conductor includes a ceiling plate section covering the chip part and side plate sections which are formed to be united with the ceiling plate section and to be at a position lower than the ceiling plate section and which are arranged on both sides in a horizontal direction of the chip part, side plates do not exist in both side ends in a front-rear direction of the shielding conductor, and the side plate sections are electrically connected via a plurality of connecting means to a ground layer of a mounting substrate.

2. An electronic device including a chip part in which the chip part is mounted on a surface of a mounting substrate, an upper surface of the chip part is coated with a shielding conductor to be united with the chip part, and the shielding conductor is electrically connected to a ground layer of the mounting substrate, characterized in that

the shielding conductor includes a ceiling plate section covering the chip part and side plate sections which are formed to be united with the ceiling plate section and to be at a position lower than the ceiling plate section and which are arranged on both sides in a horizontal direction of the chip part, and openings are formed in both side ends in a front-rear direction of the shielding conductor to open both sides in a front-rear direction of the chip part, and

the side plate sections of the shielding conductor are electrically connected via a plurality of connecting means in the front-rear direction to the ground layer of the mounting substrate.

3. An electronic device including a chip part in which the chip part is mounted on a surface of a mounting substrate, an upper surface of the chip part is coated with a shielding conductor to be united with the chip part, and the shielding conductor is electrically connected to a ground layer of the mounting substrate, characterized in that

the shielding conductor includes a ceiling plate section covering the chip part and side plate sections which are formed to be united with the ceiling plate section and to be at a position lower than the ceiling plate section and which are arranged on both sides in a horizontal direction of the chip part, and both end sides in a front-rear direction of the shielding conductor project from both side ends of the chip part, and an electromagnetic wave absorber is disposed between at least from the both side ends in a front-rear direction of the chip part to the both side ends in a front-rear direction of the shielding conductor, and

the side plate sections of the shielding conductor are electrically connected via a plurality of connecting means in the front-rear direction to the ground layer of the mounting substrate.

4. An electronic device including a chip part in accordance with one of claims 1 to 3, characterized in that the chip part includes a two-terminal chip part.

5. An electronic device including a chip part in accordance with one of claims 1 to 4, characterized in that in the shielding conductor, the shielding conductor width W is selected to have a size larger than an area in which terminals of the chip part exist, by at least twice a harmonic mean of height H of the ceiling plate section and length L of the opening in the horizontal direction of the ceiling plate section.

6. An electronic device including a chip part in accordance with

one of claims 1 to 5, characterized in that in the shielding conductor, end sections of the opening of the shielding conductor are of a size larger than an area in which terminals of the chip part exist, by at least length L of the opening in the horizontal direction of the ceiling plate section.

7. An electronic device including a chip part in accordance with one of claims 1 to 6, characterized in that more than four connecting means are used.

8. An electronic device including a chip part in accordance with one of claims 1 to 7, characterized in that a hole section is formed in the ceiling plate section of the shielding conductor to expose the chip part.

9. An electronic device including a chip part in accordance with one of claims 1 to 8, characterized in that a spring substance having elasticity is used as the shielding conductor.

10. An electronic device including a chip part in accordance with one of claims 1 to 9, characterized in that shape memory metal having a characteristic of a spring is used as the shielding conductor, a hole section is formed in the shape memory metal to expose the chip part, and the chip part is pushed by the characteristic of a spring of end sections of the hole section.

11. An electronic device including a chip part in accordance with claim 1, characterized in that a shielding conductor also serving as a cathode conductor is used in place of the shielding conductor, and the upper surface, side surfaces, and a part of surfaces of the chip part are covered by the shielding conductor also serving as a cathode conductor.

12. An electronic device including a chip part in accordance with one of claims 1 to 11, characterized in that a bump or a conductor having elasticity is used as the connecting means.

13. An electronic device including a chip part in accordance with one of claims 1 to 12, characterized in that an array-shaped chip part is used in place of the chip part and the array-shaped chip part includes a plurality of two-terminal chip parts integrated in a front-rear direction.

14. An electronic device including a chip part in accordance with claim 13, characterized in that two electrodes are formed on a mounting surface of the two-terminal chip part and both of the electrodes are connected to surface layer electric wiring formed in the horizontal direction.

15. An electronic device including a chip part in accordance with claim 11, characterized in that on a mounting surface of each of a plurality of two-terminal chip parts, only one of the electrodes is formed.

16. An electronic device including a chip part in accordance with claim 15, characterized in that the one of the electrode is connected to surface layer electric wiring formed in the horizontal direction and an optical waveguide is arranged in the horizontal direction in the mounting substrate below the array-shaped chip.

17. A method of manufacturing an electronic device including a chip part in which the chip part is mounted on a surface of a mounting substrate, an upper surface of the chip part is coated with a shielding conductor, and the shielding conductor is electrically connected to a ground layer of the mounting substrate, characterized by comprising:

a step of assembling the chip part with the shielding conductor into a unit by using a shielding conductor including a ceiling plate section covering the chip part and side plate sections which are formed to be united with the ceiling plate section and to be at a position lower than the ceiling plate section and which are arranged on both sides in a horizontal direction of the chip part and by coating an upper surface of the chip part with the ceiling plate section; and

a step of using a mounting substrate in which a ground layer is formed, arranging on the mounting substrate the shielding conductor assembled with the chip part into a unit, mounting the chip part on a surface of the mounting substrate, and electrically connecting the shielding conductor to the ground layer at the same time.

18. A method of manufacturing an electronic device including a chip part in which the chip part is mounted on a surface of a mounting substrate, an upper surface of the chip part is coated with a shielding conductor, and the shielding conductor is electrically connected to a ground layer of the mounting substrate, characterized by comprising:

a step of using a mounting substrate in which a ground layer is formed, arranging the chip part on the mounting substrate, and mounting the chip part on a surface of the mounting substrate; and

a step of using a shielding conductor including a ceiling plate section covering the chip part and side plate sections which are formed to be united with the ceiling plate section and to be at a position lower than the ceiling plate section and which are arranged on both sides in a horizontal direction of the chip part, arranging the shielding conductor on the mounting substrate, electrically connecting the shielding conductor to the ground layer, and covering an upper surface of the chip part with the ceiling plate section.

19. A method of manufacturing an electronic device including a chip part in accordance with claim 17 or 18, characterized in that a plurality of connecting means are used when the shielding conductor is electrically connected to the ground layer.